Configuring Ethernet, FDDI, and Token Ring Services

Router Software Version 11.02
Site Manager Software Version 5.02

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Bay Networks

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About This Guide

If you are responsible for configuring and managing Bay Networks® routers, read this guide to learn about physical layer (line) configuration procedures.

If you want to	Go to
Access the line services that you can configure with Site Manager.	Chapter 1
Change default settings for Ethernet line services.	Chapter 2
Change default settings for FDDI line services.	Chapter 3
Change default settings for token ring line services.	Chapter 4
Obtain information about Site Manager parameters (this is the same information you obtain using Site Manager online Help).	Appendix A
View line parameter defaults.	Appendix B
See a glossary of terms used in this guide.	Glossary

Before You Begin

Before using this guide, you must complete the following procedures:

1. Install the router (refer to the installation manual that came with your router).
2. Connect the router to the network and create a pilot configuration file (refer to *Quick-Starting Routers*, *Configuring Remote Access*, or *Connecting ASN Routers to a Network)*.
3. Add the appropriate LAN circuits for the router's hardware modules (refer to *Configuring Routers*).
4. Make sure that you are running the latest version of Bay Networks Site Manager and router software. For instructions, refer to *Upgrading Routers from Version 7–10.xx to Version 11.0*.

Conventions

bold text	Indicates text that you need to enter, command names, and buttons in menu paths. Example: Enter **wfsm &** Example: ATM DXI > Interfaces > **PVCs** identifies the PVCs button in the window that appears when you select the Interfaces option from the ATM DXI menu.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
separator (>)	Separates menu and option names in instructions and internal pin-to-pin wire connections. Example: Protocols > AppleTalk identifies the AppleTalk option in the Protocols menu.

Acronyms

ANSI	American National Standards Institute
AUI	Attachment Unit Interface
BofL	Breath of Life (message)
CCITT	International Telegraph and Telephone Consultative Committee (now ITU-T)
CSMA/CD	carrier sense multiple access with collision detection
FDDI	Fiber Distributed Data Interface
FDL	facility data link
IP	Internet Protocol
ISO	International Organization for Standardization
ITU-T	International Telecommunications Union-Telecommunications (formerly CCITT)
LAN	local area network
MAC	media access control
MAU	media access unit
MDI	media-dependent interface

MIB	management information base
MIC	media interface connector
MII	media-independent interface
NBMA	nonbroadcast multi-access
NCP	Network Control Protocol
NLPID	Network Layer Protocol Identifier
NSAP	Network Service Access Point
OSI	Open Systems Interconnection
PCM	Physical Connection Management (FDDI)
PDU	Protocol Data Unit
PHY	Physical Layer Protocol (FDDI)
PMD	Physical Layer Media Dependent (FDDI)
PPP	Point-to-Point Protocol
PROM	programmable read-only memory
RMT	Ring Management (FDDI)
SMT	Station Management (FDDI)
SNMP	Simple Network Management Protocol
STP	shielded twisted pair
TCP/IP	Transmission Control Protocol/Internet Protocol
Telnet	Telecommunication Network
TPE	twisted-pair Ethernet
TTP	Timed-Token protocol
TTRT	target token rotation time
UTP	unshielded twisted pair

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Chapter 1
Getting Started

This chapter describes how to access the physical and data link layer (*line*) services for configured LAN circuits on a Bay Networks router.

Note: In the OSI internetworking model, the *physical layer* manages the transmission of bits across the physical media (for example, cable or modem interface); a physical layer protocol defines the electrical and mechanical interface. The *data link layer* defines the procedures for transferring data accurately and reliably across the physical layer.

What's the Default Configuration?

Router software automatically sets default values for line service parameters when you add an Ethernet, FDDI, or token ring circuit.

Line defaults are suitable for many networks; however, you can use the Configuration Manager to customize the default settings based on your network composition and requirements.

See Appendix B for a list of the default Ethernet, FDDI, and token ring line service parameter values.

Accessing Line Services with Site Manager

Note: This guide assumes that you are working with a router configuration file that already contains the appropriate WAN circuits for the hardware configuration. See *Configuring Routers* for information about adding circuits to a configuration file.

To access the Site Manager windows that contain line services for the configured LAN circuits on a Bay Networks router:

1. **Start at the Configuration Manager window (Figure 1-1).**

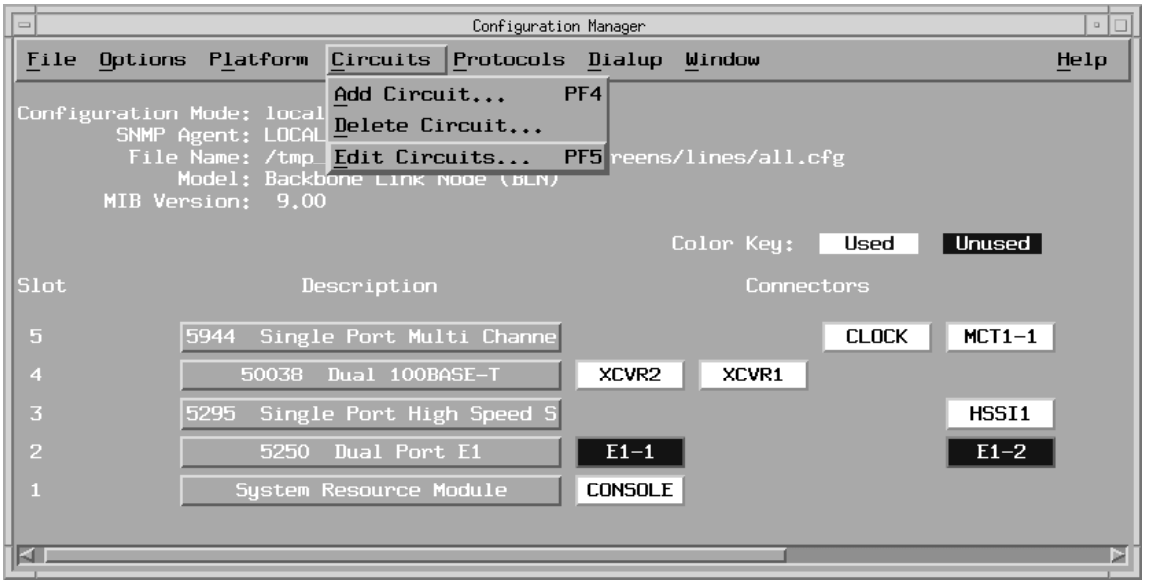

Figure 1-1. Configuration Manager Window

Note: For many circuit types, you can bypass Steps 2 through 6 by clicking on the configured connector in the Configuration Manager window, and then clicking on Edit Line in the popup window.

2. **Select Circuits > Edit Circuits.**

   The Circuit List window appears (Figure 1-2).

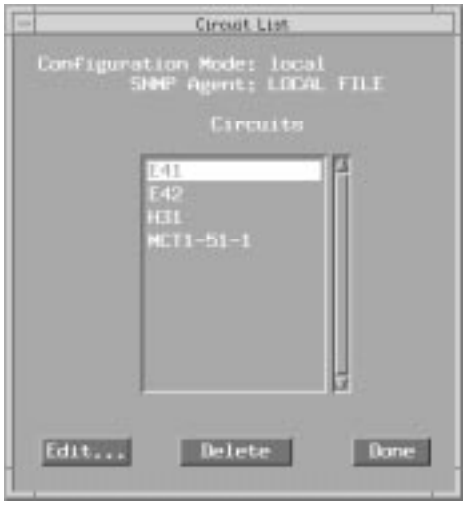

Figure 1-2. Circuit List Window

3. **Select the circuit for which you want to edit line service parameters.**

   Table 1-1 lists the Configuration Manager abbreviation for each LAN circuit type.

Table 1-1. Site Manager Abbreviations for Circuit Types

Letter Designator	Circuit Type
E	Ethernet
F	FDDI
O	Token Ring

4. **Click on Edit.**

   The Circuit Definition window appears (Figure 1-3).

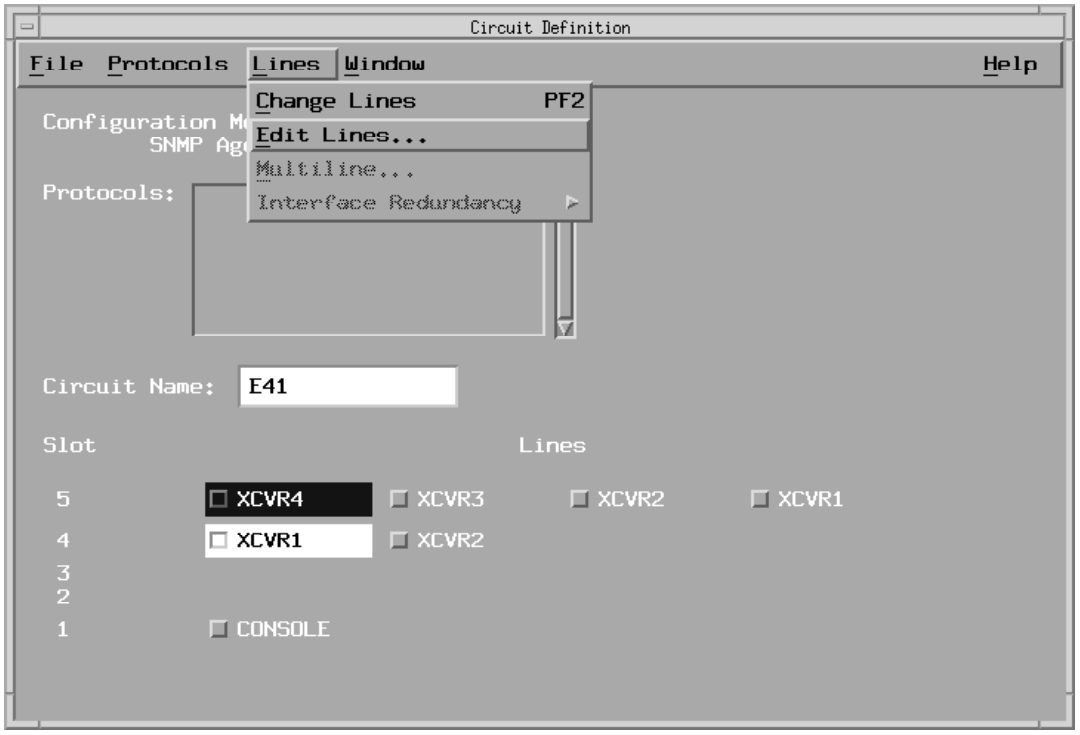

Figure 1-3. Circuit Definition Window

5. **Select Lines > Edit Lines.**

   The Edit Lines window appears (Figure 1-4). This window lists the existing lines by slot number and connector name.

Figure 1-4. Edit Lines Window

6. **Select the line you want to edit and click on Edit.**

   Depending on the type of circuit that you selected in Step 3, the Configuration Manager displays the window that allows you to modify the circuit's line details.

7. **Edit the line attributes.**

   The circuit type determines how you edit line services. Table 1-2 provides information about editing the line parameters for specific circuit types.

Table 1-2. Getting Information about Line Services

Line Type	Go To
Ethernet	Chapter 2
FDDI	Chapter 3
Token ring	Chapter 4
ATM FRE®-2, ATM ARE	*Configuring ATM Services*
ATM DXI, E1, HSSI, T1, synchronous, asynchronous, LAPB, MCE1, and MCT1	*Configuring WAN Line Services*

Chapter 2
Configuring Ethernet Services

The following sections of this chapter describe how to edit physical layer parameters for Ethernet router interfaces:

- About Bay Networks Ethernet Media
- Enabling or Disabling an Ethernet Interface
- Configuring BofL Messages
- Enabling or Disabling Hardware Filtering
- Setting the 100Base-T Line Speed

Chapter 1 describes how to access the Edit CSMA/CD Parameters window (Figure 2-1) or the Edit 100Mb/s CSMA/CD Parameters window (Figure 2-2).

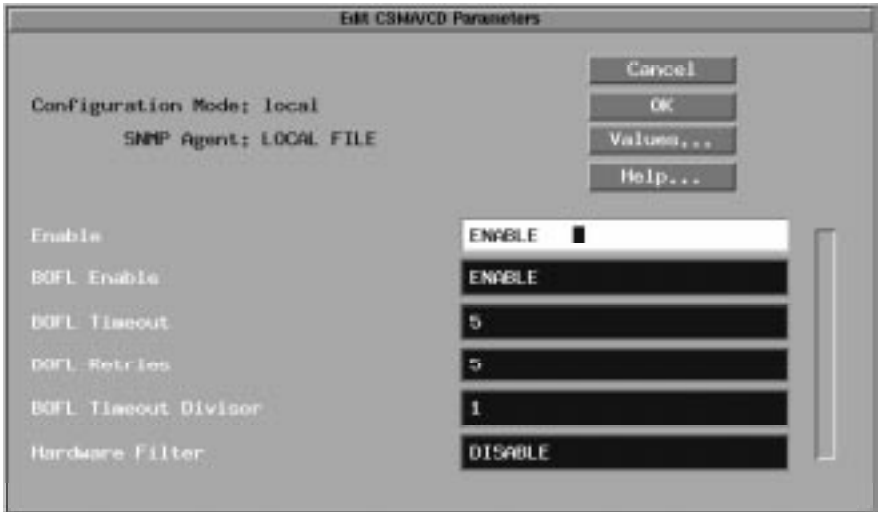

Figure 2-1. Edit CSMA/CD Parameters Window

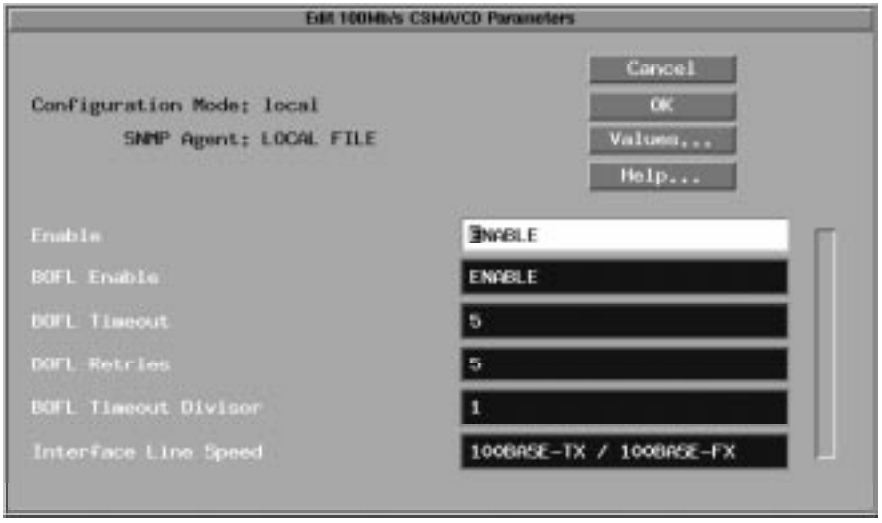

Figure 2-2. Edit 100Mb/s CSMA/CD Parameters Window

About Bay Networks Ethernet Media

The Bay Networks Ethernet/802.3 interface supports IEEE 802.3 and Version 1.0/2.0 Ethernet frame formats. Ethernet circuits use carrier sense multiple access with collision detection (CSMA/CD) to manage access to the physical media in a baseband LAN.

10Base-T interfaces operate at 10 megabit/second (Mb/s) over twisted wire or coaxial cable. 100Base-T interfaces (sometimes called Fast Ethernet) operate at 100 Mb/s. Refer to the *Bay Networks Guide to Understanding 100Base-T* for detailed information.

The following sections describe proprietary features of Bay Networks Fast Ethernet router services, and provide hints and notes for operation:

- 100Base-T Media
- 100Base-T Packet Size

100Base-T Media

Each Bay Networks 100Base-T router port provides two physical connectors for LAN media:

- Media Dependent Interface (MDI): RJ-45 connector to integral transceiver
- Media Independent Interface (MII): DB-40 connector to an external transceiver

Which connector you use determines the supported features of 100Base-TX and 100Base-FX operation (Table 2-1).

Table 2-1. 100Base-T Features

Operation	Cabling	Physical Interface	Automatic Line Negotation	Full Duplex *	Congestion Control *
100Base-TX (MDI)	Category 5 unshielded twisted pair (UTP) copper	RJ-45 connector	Supported	Supported	Supported
100Base-FX (MII)	Multimode Fiber optic	DB-40 connector to external transceiver	Not supported	Supported	Not supported
100Base-TX (MII)	UTP	DB-40 connector to external transceiver	Supported	Not supported	Not supported

*. The current implementation of the Ethernet standard does not address full-duplex operation or congestion control; these are proprietary features.

100Base-T Packet Size

When using the 100Base-T Link Module, larger packet sizes yield better performance than smaller packet sizes. In general, you should configure your application to use the largest packet size possible.

Note: To obtain the highest aggregate throughput, use only one port on a 100Base-T Link Module. Demanding high throughput from both ports simultaneously will result in some packet loss, which may decrease the performance of sensitive applications.

Enabling or Disabling an Ethernet Interface

The router enables CSMA/CD services when you add a 10-Mb/s or 100-Mb/s Ethernet circuit to the router configuration file.

You can disable and enable the Ethernet interface without moving physical cabling.

Site Manager: Enable parameter: page A-1

Configuring BofL Messages

For carrier detection on Ethernet circuits, the router sends breath of life (BofL) messages whenever the interface transmitter is idle. When there is no data traffic, BofL messages signify that the Ethernet LAN is up and functioning normally.

These sections describe how to configure BofL transmissions:

- Enabling or Disabling BofL Messages
- Setting the BofL Timeout
- Setting BofL Retries
- Setting the BofL Timeout Divisor

With default values configured, the router declares an Ethernet interface down after 25 seconds (five retries of 5 seconds each) without a successful frame transmission.

Note: When you configure router redundancy on an Ethernet interface, Site Manager automatically adjusts BofL parameters to reduce the time it takes the router to declare an interface down when there is a loss of service. With default router redundancy values configured, the router declares the interface down after 2 seconds (four retries of .05 seconds each).

Enabling or Disabling BofL Messages

With BofL enabled, the router sends polling messages from this Ethernet interface to all systems on the local network.

Note: The router does not send BofL messages if it is already transmitting regular data traffic.

BofL messages are enabled by default on every Ethernet interface. You can disable and enable BofL messages on an interface.

Site Manager: BofL Enable parameter: page A-2

Setting the BofL Timeout

With BofL enabled, a network timeout will occur if five periods elapse without a successful BofL message transmission. When timeout occurs, the router automatically disables and reenables the Ethernet interface. For example, if you set the BofL Timeout interval to 10 seconds, the interface must successfully transmit a BofL message within 50 seconds.

The BofL Timeout interval is 5 seconds by default. You can change the interval of BofL messages to a value from 1 to 60 seconds.

Site Manager: BofL Timeout parameter: page A-2

Setting BofL Retries

By default, the router makes five attempts to transmit a BofL message before declaring the Ethernet interface down. With router redundancy enabled, the default is four attempts.

You can specify the number of transmission attempts, from 1 to 60 retries, before the router declares the circuit down.

Either accept the default of five BofL Retries, or specify a value from 1 to 60. Use this parameter in conjunction with the BofL Timeout Divisor and BofL Timeout parameters to decrease or increase the time it takes the router to declare an interface down.

Site Manager: BofL Retries parameter: page A-3

Setting the BofL Timeout Divisor

By default, the router uses the value of the BofL Timeout parameter to determine the time period between transmissions of BofL messages from an Ethernet interface. The actual interval between BofL transmissions is the value of the BofL Timeout parameter divided by the value of the BofL Timeout Divisor parameter. When BofL Timout Divisor is set to the default value of 1, it has no effect on the value of BofL Timeout. When set to a value greater than 1, the BofL Timeout Divisor reduces the value of BofL Timeout.

When you configure router redundancy on an interface, Site Manager automatically sets the BofL Timeout Divisor parameter to 10. This reduces the time between BofL transmissions, which reduces the time it takes the router to declare a circuit down.

Set the value of this parameter to an integer from 2 to 100 if you want a BofL timeout to be detected in less than one second. Leave this parameter set to 1 and use the BofL Timeout parameter for 1- to 5-second timeout values.

For example, with the BofL Timeout parameter set to 5 seconds and the BofL Timeout Divisor set to 10, the router sends a BofL message every 0.5 second (5 divided by 10). With BofL Timeout set to 5 seconds and the BofL Timeout Divisor set to 1, transmissions are every 5 seconds.

Site Manager: BofL Timeout Divisor parameter: page A-4

Enabling or Disabling Hardware Filtering

When you add an Ethernet circuit for a link or net module with hardware filter capability, Site Manager displays the prompt

```
Do you want to enable Hardware Filters on this circuit?
```

Hardware filtering is disabled by default, but changes to enabled if you reply OK to this prompt.

With hardware filtering enabled, the Ethernet interface drops local frames instead of copying them into router memory to be processed. *Local frames* are frames that contain both destination and source MAC addresses that the router has learned on this Ethernet interface. Bridge software teaches the hardware filter which MAC addresses are local to an interface.

Enabling hardware filtering improves bridging software performance, because the router does not need to determine whether to receive and reject local frames.

You can enable or disable hardware filtering. Set to Enable only if the link or net module has hardware filters and you enabled the bridge software.

Site Manager: Hardware Filter parameter: page A-3

Setting the 100Base-T Line Speed

To match the physical wiring in your 100Base-T LAN, you can set the line speed and duplex setting to

- 100Base-T half-duplex (the default) -- *Half-duplex* operation indicates that data flows both into and out of the interface, but not simultaneously. Use this setting for most Ethernet LANs.
- 100Base-T full-duplex (100Base-FD) -- *Full-duplex* operation allows simultaneous transmission and reception on the interface. Use this setting for fiber optic LANs that cover a great distance.

Note: Full-duplex operation does not increase performance. It does increase the maximum length of the physical network by lifting restrictions imposed by collision detection in half-duplex circuits.

- Full-duplex with congestion control (100Base-FD w/ Cong Control) -- This setting enables the Bay Networks proprietary Congestion Control algorithm (a form of flow control) in full duplex operation. Use this setting to interoperate with the Bay Networks Model 28115 Ethernet Switching Hub.
- Automatic line speed negotiation (Auto Negotiation) -- The router automatically negotiates with end nodes to determine the correct line speed configuration to use on the interface.

Site Manager: Interface Line Speed parameter: page A-5

If you set the Interface Line Speed parameter to Auto Negotiation, continue with the next two sections:

- Configuring Automatic Line Speed Negotiation
- Viewing Line Negotiation Status

Configuring Automatic Line Speed Negotiation

When you set the line speed to Automatic Negotiation, the Configuration Manager prompts for additional information (Figure 2-3).

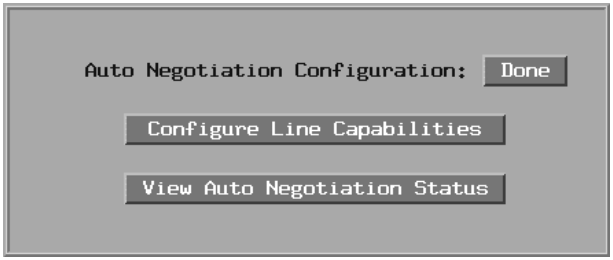

Figure 2-3. Auto Negotiation Configuration Prompt

To configure automatic line speed negotiation:

1. **Click on Configure Line Capabilities.**

   The Auto Neg Advertising Capabilities window appears (Figure 2-4).

Figure 2-4. Auto Neg Advertising Capabilities Window

   Site Manager negotiates with remote nodes that also have automatic line negotiation by advertising the capabilities of this 100-Mb/s interface.

   By default, Site Manager advertises 100Base-TX, both half- and full-duplex operation. Note that the negotiated full-duplex support is without congestion control.

2. **Click on Values to select the Line Advertising Capabilities.**

You can set the advertised line speed to

- 100Base-TX, half-duplex only
- 100Base-TX, full-duplex only
- 100Base-TX, both half- and full-duplex
- No advertising

To maximize throughput, operate at half-duplex (the default setting). Configuring one of the full-duplex settings will not increase throughput and may, in some cases, decrease throughput. Use a full-duplex setting only to allow operation at greater distances over fiber optic cable.

Site Manager: Line Advertising Capabilities parameter: page A-5

Viewing Line Negotiation Status

To view the current line negotiation status:

1. **Start at the Auto Negotiation Configuration prompt (refer to Figure 2-3).**
2. **Click on View Auto Negotiation Status.**

Note: Site Manager can report line negotiation status only in dynamic mode.

The Auto Negotiation State Information window appears (Figure 2-5). This window provides details about the current line configuration. Table 2-2 provides information about the status display.

3. **Proceed as follows, depending on the status of the transaction:**
   - If negotiation or data transmission is taking place, click on OK.

     The Auto Negotiation State Information window closes, and negotiation or data transmission continues.
   - If there is a problem with the line, click on Restart.

     This action resets all automatic line negotiation parameters and restarts the line negotiation process.

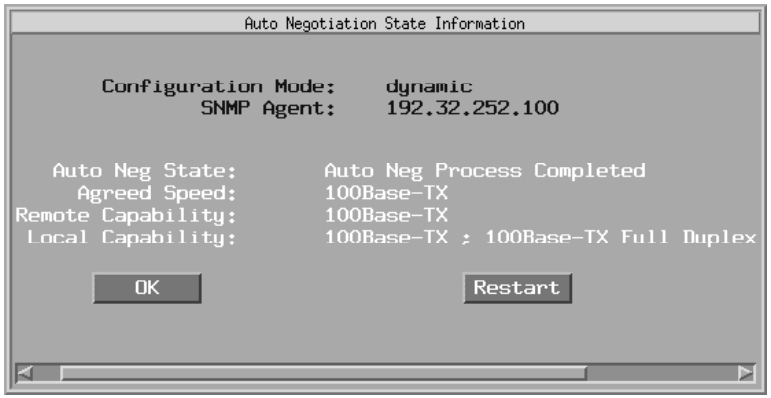

Figure 2-5. Sample Auto Negotiation State Information Window

Table 2-2. 100-Mb/s Ethernet Auto Negotiation State Information

Category	State Displayed	Description
Auto Neg State	Auto Neg Process Completed	The router and the endstation have successfully negotiated a line speed and data transmission is taking place.
	Auto Neg Process Occurring	The router and the endstation are currently negotiating a line speed.
	State Unknown	The router and the endstation cannot begin line negotiation, probably because the remote station does not have automatic line negotiation capability.
Agreed Speed	100Base-TX	The line is processing at 100 Mb/s half-duplex.
	100Base-TX Full Duplex	The line is processing at 100 Mb/s full-duplex.
Remote Capability	Any valid CSMA/CD line speed	This indicates the line speed configuration that the remote endstation is currently advertising for this line.
Local Capability	100Base-TX	This indicates the line speed or speeds that the router is currently advertising for this line (the current setting of the Line Advertising Capabilities parameter).
	100Base-TX Full Duplex	
	100Base-TX; 100Base-TX Full Duplex	

Chapter 3
Configuring FDDI Services

The following sections in this chapter describe how to edit physical and link layer parameters for FDDI interfaces:

- About Bay Networks FDDI Media
- Enabling or Disabling a FDDI Interface
- Enabling or Disabling BofL Messages
- Setting the BofL Interval
- Enabling or Disabling Hardware Filtering
- Editing FDDI SMT Attributes
- Editing MAC Attributes
- Editing FDDI Path Attributes
- Editing FDDI Port Attributes

Refer to Chapter 1 for information about accessing the Edit Token Ring Parameters window (Figure 3-1).

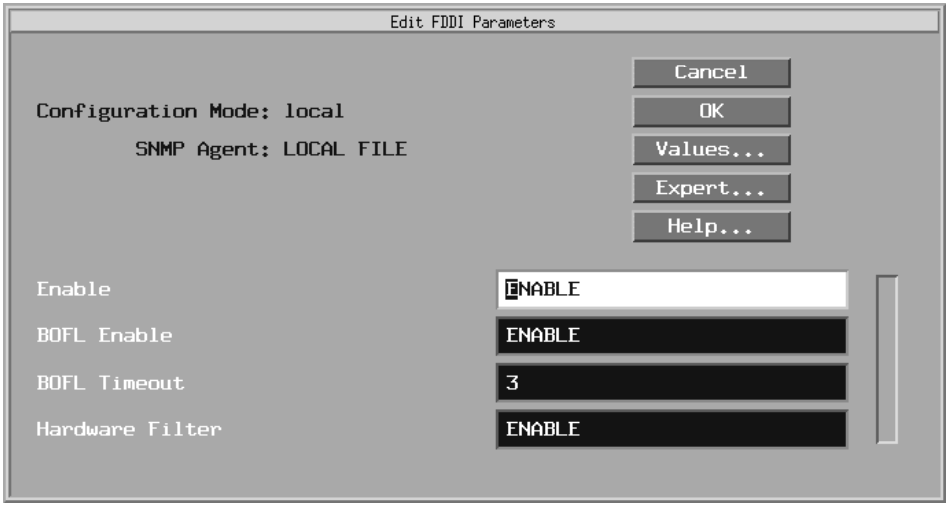

Figure 3-1. Edit FDDI Parameters Window

About Bay Networks FDDI Media

Fiber Distributed Data Interface (FDDI) comprises a set of ANSI/ISO standards that define a 100-Mb/s, timed-token-passing LAN of up to 500 nodes. FDDI is used most often for workgroup, backbone, and backend network configurations that require high bandwidth and performance.

Bay Networks provides FDDI interfaces for multimode or single-mode 100-Mb/s FDDI LANs, including hybrid FDDI link modules for both single-mode and multimode fiber interfaces.

All FDDI interfaces support a Class A dual-attachment or a dual-homing Class B single attachment. The FDDI link and net modules include two Media Interface Connector (MIC) plugs as well as one RJ-11 connector for attachment to an optional external optical bypass unit.

Enabling or Disabling a FDDI Interface

The router enables FDDI line services when you add the interface. You can disable and enable the interface without moving physical cables.

Site Manager: Enable parameter: page A-6

Enabling or Disabling BofL Messages

With BofL enabled, the router sends polling messages from this interface to all systems on the local network. BofL messages signify that the FDDI interface is up and functioning normally when there is no data traffic.

If the link becomes unavailable and both this parameter and the LLC Data Enable parameter are enabled, the router disables the LLC interface after the time you specify using the BofL Timeout parameter. When you set this parameter to Disable, the router disables the LLC interface immediately after the link becomes unavailable.

By default, BofL messages are enabled when you add the circuit. You can disable and reenable BofL messages on an interface.

Site Manager: BofL Enable parameter: page A-6

Setting the BofL Interval

The BofL interval is the amount of time the router waits before disabling the LLC interface when the link becomes unavailable and BofL is enabled.

By default, the BofL interval is 5 seconds. You can change the interval of BofL messages to a value from 1 to 60 seconds.

Site Manager: BofL Timeout parameter: page A-7

Enabling or Disabling Hardware Filtering

When you add a FDDI circuit for a link module with hardware filter capability, Site Managers displays the prompt

```
Do you want to enable Hardware Filters on this circuit?
```

Hardware filtering is disabled by default, but changes to enabled if you reply OK to this prompt.

With hardware filtering enabled, the FDDI interface drops local frames instead of copying them into system memory to be processed by the bridge software. *Local frames* are frames that contain both destination and source MAC addresses that the router has learned on the interface. Bridge software teaches the hardware filter which MAC addresses are local to an interface.

Enabling hardware filtering improves bridging software performance, since the router software does not need to determine whether to receive and reject local frames.

You can enable or disable hardware filtering on an interface. Set to Enable only if the FDDI link module has hardware filters and you enabled bridge software.

Site Manager: Hardware Filter parameter: page A-7

Editing FDDI SMT Attributes

The FDDI Station Management (SMT) standard defines the protocols for managing the Physical Layer Media Dependent (PMD), the Physical Layer Protocol (PHY), and the Media Access Control (MAC) components of FDDI. The SMT protocols monitor and control the activity of each node on the ring. Bay Networks routers support Version 7.2 of the SMT protocol. SMT contains three components:

- Connection Management (CMT)
- Ring Management (RMT)
- SMT frame services

To edit the SMT parameters for a FDDI line:

1. **Click on Expert at the Edit FDDI Parameters window (refer to Figure 3-1).**

   The FDDI Advanced Attributes window appears (Figure 3-2).

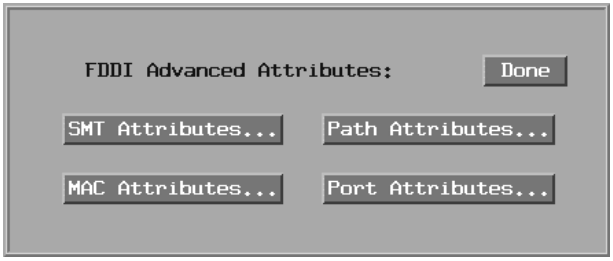

Figure 3-2. FDDI Advanced Attributes Window

Caution: Changing any of the FDDI Advanced Attributes parameters will affect the operation of your FDDI network. Before modifying these parameters, you should understand how to use them to improve network performance.

2. **Click on SMT Attributes.**

   The FDDI SMT Attributes window appears (Figure 3-3).

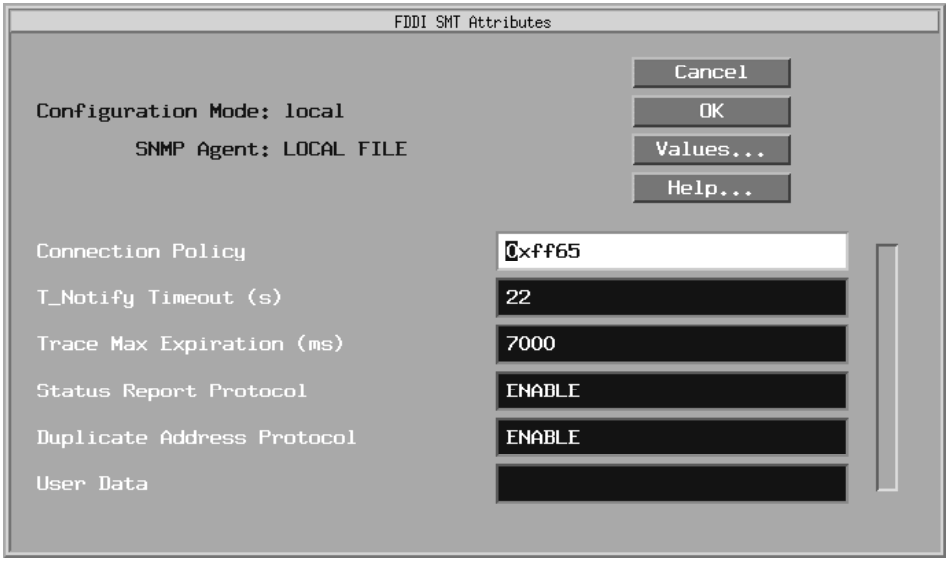

Figure 3-3. FDDI SMT Attributes Window

The following sections describe how you can configure SMT:

- Specifying the SMT Connection Policy
- Specifying the Neighbor Notification Interval
- Specifying the Propagation Expiration Time
- Enabling or Disabling Status Report Frames
- Enabling or Disabling Duplicate Addressing
- Entering User Data

Specifying the SMT Connection Policy

A FDDI station sets the corresponding policy for each of the connection types that it wants to reject. The policy descriptor takes the form “rejectX-Y” where X denotes the physical connection (PC) type of the local port, and Y denotes the PC type of the neighbor port.

X and Y can have the following values:

- A -- Indicates that the port is a dual-attachment station or concentrator that attaches to the primary IN and the secondary OUT when attaching to the dual FDDI ring
- B -- Indicates that the port is a dual-attachment station or concentrator that attaches to the secondary IN and the primary OUT when attaching to the dual FDDI ring
- S -- Indicates a port in a single-attachment station or concentrator
- M -- Indicates a port in a concentrator that serves as a master to a connected station or concentrator

To set the connection policies that you want this line to reject, you specify a status word with a value from 0x0 to 0xffff.

Use the following formula to determine the value of the status word:

1. Start with a value of zero for the status word (all bits set to 0).
2. For each connection policy that you want the node to reject, add to the status word value the number 2 raised to a power specified in Table 3-1. This is equivalent to setting a bit to 1 for each policy that you want the node to reject.

You set the status word value to reflect local connection policies. Setting a particular connection policy does not necessarily mean that the station will reject the connection. The SMT standard requires that both sides of the connection must agree to reject, or else *both* sides must accept, the connection.

Note: The SMT standard requires that you set Bit 15 (rejectM-M) to 1.

Table 3-1 lists the powers and the bits for each policy range.

Table 3-1. SMT Connection Policy Values

Policy	Power (Bit Number)	Policy	Power (Bit Number)
rejectA-A	0	rejectS-A	8
rejectA-B	1	rejectS-B	9
rejectA-S	2	rejectS-S	10
rejectA-M	3	rejectS-M	11
rejectB-A	4	rejectM-A	12
rejectB-B	5	rejectM-B	13
rejectB-S	6	rejectM-S	14
rejectB-M	7	rejectM-M	15

Figure 3-4 shows the default connection policy, status word 0xff65.

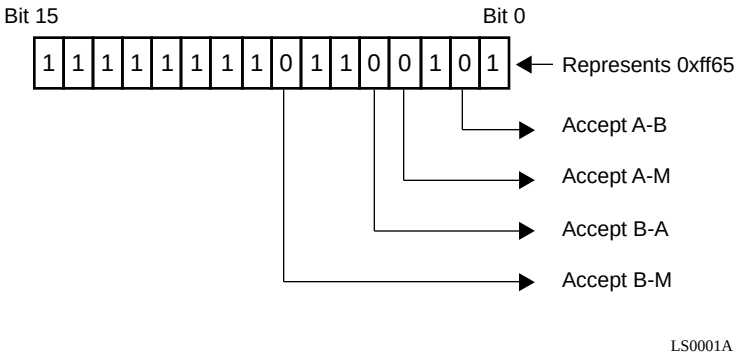

Figure 3-4. Default Connection Policy Status Word

You can use Site Manager to set the SMT Connection Policy.

Site Manager: Connection Policy parameter: page A-8

Specifying the Neighbor Notification Interval

Neighbor information frames (NIFs) identify the upstream and downstream neighbors of each node. A Bay Networks station issues a response to the sender of a NIF frame and generates NIF requests as part of the neighbor notification process.

You can set the interval between successful iterations of the Neighbor Notification Protocol on an interface to a value from 2 to 30 seconds. By default, the interval is 22 seconds. This interval

- Determines the MAC addresses of the upstream and downstream neighbors
- Detects duplicate MAC addresses on the ring
- Generates periodic “keepalive” traffic that verifies the local MAC transmit and receive paths

You can use Site Manager to set the Neighbor Notification interval.

Site Manager: T_Notify Timeout parameter: page A-8

Specifying the Propagation Expiration Time

A trace is a diagnostic function that isolates a fault on the ring. By default, the maximum propagation time for a trace on a FDDI topology is 7 seconds. You can set the propagation expiration time to a value from 6001 to 256000 milliseconds (ms).

Site Manager: Trace Max Expiration (ms) parameter: page A-9

Enabling or Disabling Status Report Frames

Status report frames (SRFs) allow the Status Report protocol to report node conditions and events. A *condition* is when a node enters a specific state (for example, duplicate address detected). An *event* is an immediate occurrence (for example, the generation of a trace).

By default, the FDDI line generates an SRF announcement frame for its implemented events (for example, high bit errors, topology changes, trace status events, MAC frame error condition, and MAC duplicate address condition).

You can disable or enable SRFs for this circuit. We recommend enabling SRFs to ensure that your FDDI network is ANSI-compliant.

Site Manager: Status Report Protocol parameter: page A-9

Enabling or Disabling Duplicate Addressing

By default, the router implements an optional ANSI duplicate address test involving periodic transmission of Network Service Address Network Interface Function (NSA NIF) frames to the source.

You can disable or enable duplicate addressing on an interface.

Site Manager: Duplicate Address Protocol parameter: page A-10

Entering User Data

You can enter up to 32 alphanumeric characters of site-specific information to be attached to the status information frame (SIF) frames on this interface.

Site Manager: User Data parameter: page A-9

Editing MAC Attributes

The FDDI Media Access Control (MAC) standard defines the timed-token protocol, frame and token construction and transmission on the FDDI ring, ring initialization, and fault isolation.

To edit the MAC parameters for a FDDI line:

1. **Click on Expert at the Edit FDDI Parameters window (refer to Figure 3-1).**

   The FDDI Advanced Attributes window appears (refer to Figure 3-2).

2. **Click on MAC.**

3. **Click on MAC Attributes.**

   The FDDI MAC Attributes window appears (Figure 3-5).

Figure 3-5. FDDI MAC Attributes Window

Enabling or Disabling MAC LLC

When the ring becomes operational, the FDDI interface exchanges Logical Link Control (LLC) Protocol Data Units (PDUs) between the MAC and the local LLC entity. You can enable or disable transmission of PDUs on an interface.

Site Manager: LLC Data Enable parameter: page A-10

Note: Enabling or disabling this parameter does not affect transferring and receiving MAC or SMT frame types.

Editing FDDI Path Attributes

FDDI nodes exchange frames using the Timed-Token Protocol (TTP). The TTP defines how the target token rotation time (TTRT) is set, the length of time a node can hold the token, and how a node initializes the ring.

Each node is responsible for monitoring the integrity of the ring. By using a minimum valid transmission time (TVX), nodes can detect a break in ring activity. If the interval between token receptions exceeds the value of the TVX, the node reports an error condition and initiates the claim process to restore ring operation.

The TTRT carried in claim frames issued by the FDDI station are known as path attributes. Figure 3-6 illustrates their relationship.

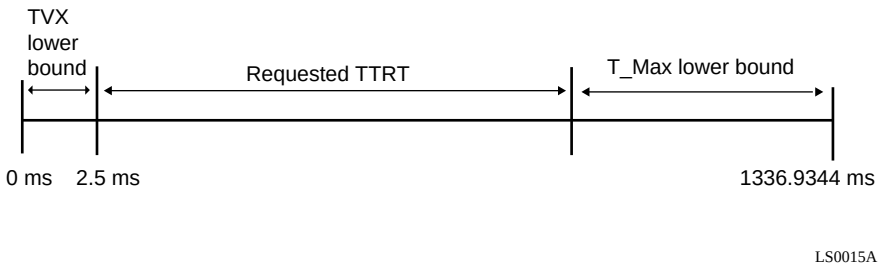

Figure 3-6. Range of Values for FDDI Path Attributes

To edit the path attributes for a FDDI line:

1. **Click on Expert at the Edit FDDI Parameters window (refer to Figure 3-1).**

   The FDDI Advanced Attributes window appears (refer to Figure 3-2).

2. **Click on Path Attributes.**

   The FDDI Path Attributes window appears (Figure 3-7).

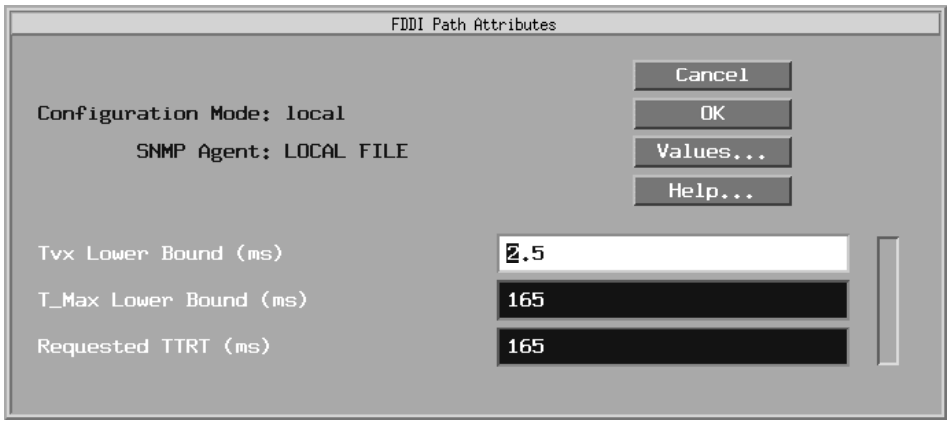

Figure 3-7. FDDI Path Attributes Window

You can set FDDI path attributes by

- Specifying the Minimum TVX
- Specifying the Maximum TTRT
- Specifying the Requested TTRT

Specifying the Minimum TVX

The minimum TVX must be

- Greater than zero
- Less than the Requested TTRT value

By default, the minimum TVX is 2.5 ms. Refer to Figure 3-6 for the range of values for TVX Lower Bound, in relation to the other TTRT parameters.

Site Manager: Tvx Lower Bound (ms) parameter: page A-11

Specifying the Maximum TTRT

The Maximum TTRT value must be

- Greater than or equal to 10 ms
- Greater than or equal to the value of the Requested TTRT parameter
- Less than or equal to 1336.9344 ms

Refer to Figure 3-6 for the range of values for T_Max Lower Bound, in relation to the other TTRT parameters.

Site Manager: T_Max Lower Bound (ms) parameter: page A-11

Specifying the Requested TTRT

The Requested TTRT value must be

- Greater than the minimum TVX, specified with the TVX Lower Bound parameter
- Less than or equal to the maximum TTRT (T_Max Lower Bound parameter)

Caution: Be extremely careful when editing FDDI path parameters such as Requested TTRT. Change the default values only if the network is part of a production or other specialized environment that requires customizing the parameters.

Refer to Figure 3-6 for the valid range of values for Requested TTRT, in relation to the other TTRT parameters.

Site Manager: Requested TTRT (ms) parameter: page A-12

Editing FDDI Port Attributes

Port attributes report the connection capabilities of a FDDI port, including the link error rate (LER).

A Status Report Frame (SRF) can contain link error monitor (LEM) status indicating the number times that a link has been rejected. This is used to keep track of the link error rate (LER).

To edit the port attributes for a FDDI line:

1. **Click on Expert at the Edit FDDI Parameters window (refer to Figure 3-1).**

   The FDDI Advanced Attributes window appears (refer to Figure 3-2).

2. **Click on Port Attributes.**

   The FDDI Port Attributes window appears (Figure 3-8).

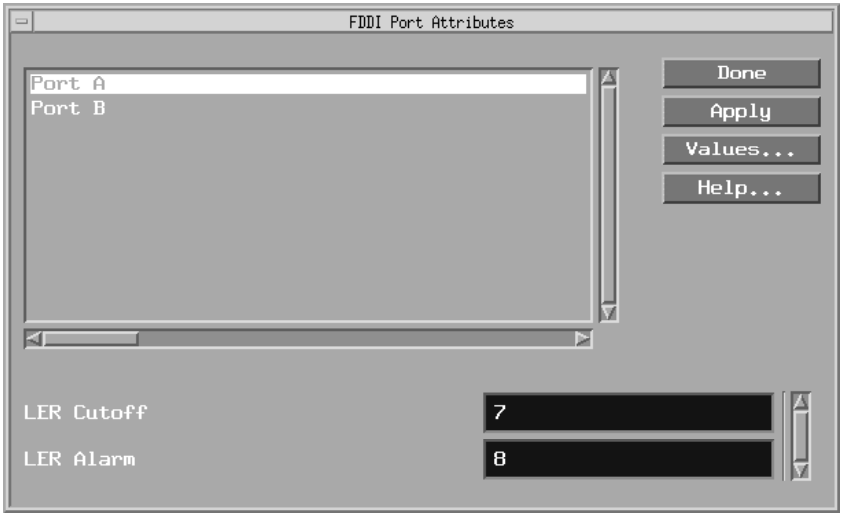

Figure 3-8. FDDI Port Attributes Window

You can configure the LER by

- Specifying the LER Cutoff
- Specifying the LER Alarm

Specifying the LER Cutoff

The LER cutoff is an estimate at which a link connection will be broken. The LER cutoff ranges from 10^4 to 10^{15} and is reported as the absolute value of the base 10 logarithm. By default, the LER cutoff is 10^7.

You can set the LER cutoff for an interface.

Site Manager: LER Cutoff parameter: page A-12

Specifying the LER Alarm

The LER alarm rate is an estimate at which a link connection generates an alarm. The LER alarm ranges from 10^4 to 10^{15} and is reported as the absolute value of the base 10 logarithm of the estimate. By default, the LER alarm is 10^8.

Site Manager: LER Alarm parameter: page A-12

Chapter 4
Configuring Token Ring Services

The following sections in this chapter describe how to edit physical and link layer parameters for token ring interfaces:

- About Bay Networks Token Ring Media
- Enabling or Disabling a Token Ring Interface
- Specifying a MAC Address Override
- Specifying a MAC Address Source
- Specifying the Ring Speed
- Enabling or Disabling Early Token Release

Refer to Chapter 1 for information about accessing the Edit Token Ring Parameters window (Figure 4-1).

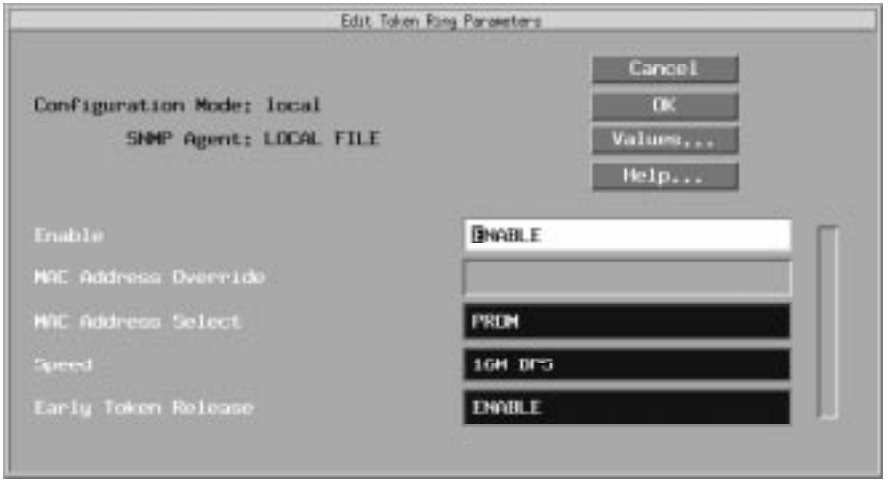

Figure 4-1. Edit Token Ring Parameters Window

About Bay Networks Token Ring Media

Token ring is a 4- or 16-Mb/s token-passing, baseband LAN that operates in a ring topology that conforms to the IEEE 802.5 standard. It is compatible with IEEE 802.2 Type 1 (connectionless) and Type 2 (connection-oriented) support.

A token ring LAN uses shielded or unshielded twisted pair cable; the interface supports IBM Type 1 and Type 3 cabling.

Enabling or Disabling a Token Ring Interface

The router enables token ring line services when you add the circuit. You can disable and enable the interface without moving physical cabling.

Site Manager: Enable parameter: page A-13

Specifying a MAC Address Override

To specify a MAC address for an interface (for example, to avoid host number conflicts on a directly connected IPX or XNS network), use this parameter to enter the 48-bit MAC address in MSB format; that is, enter 0x followed by 12 hexadecimal digits.

If you want the router to generate the MAC address for this token ring interface, do not change this parameter from its default value of zero.

If you enter a MAC address with this parameter, you must set the MAC Address Source to CNFG, as described in the next section.

Site Manager: MAC Address Override parameter: page A-13

Specifying a MAC Address Source

By default, the token ring interface uses the MAC address stored in the programmable read-only memory (PROM) on the link module.

You can set the source for MAC addresses on a token ring interface to

- BOXWIDE -- The interface uses a MAC address that the software generates from the router's serial number.
- PROM -- The interface uses a MAC address from the PROM on the Token Ring link module.
- CNFG -- You explicitly assign a MAC address with the MAC Address Override parameter.

Site Manager: MAC Address Select parameter: page A-14

Specifying the Ring Speed

You can set the ring speed for a token ring interface to 4 or 16 Mb/s. By default, the ring speed is 16 Mb/s.

If you use 16 Mb/s, the router enables the Early Token Release protocol, which is used extensively on 16-Mb/s media. In the unlikely event that you want to disable Early Token Release over 16-Mb/s token ring media, disable Early Token Release as described in the next section.

Site Manager: Speed parameter: page A-14

Enabling or Disabling Early Token Release

Early token release indicates that the token can return to the ring before the recipient copies all data. By default, Site Manager enables early token release on an interface.

You can disable or enable early token release on an interface only when the Ring Speed is16 Mb/s.

Site Manager: Early Token Release parameter: page A-15

Appendix A
Site Manager Line Services Parameters

This appendix contains reference information on Site Manager Line Service parameters in the following sections:

- CSMA/CD Line Parameters
- FDDI Line Parameters
- Token Ring Line Parameters

For each parameter associated with a physical layer protocol, this appendix provides the Site Manager menu path to each parameter, information about default settings, valid parameter options, the parameter function, instructions for setting the parameter, and the MIB object ID.

CSMA/CD Line Parameters

Parameter:	**Enable**
Path:	Configuration Manager > **XCVR** Connector > **Edit Line** > Edit CSMA/CD Parameters
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables this Ethernet line.
Instructions:	Select Enable or Disable.
MIB Object ID:	1.3.6.1.4.1.18.3.4.1.1.2

Parameter: BofL Enable

Path: Configuration Manager > **XCVR** Connector > **Edit Line** > Edit CSMA/CD Parameters

Default: Enable

Range: Enable | Disable

Function: When set to Enable, the router sends BofL polling messages from this system to all systems on the local network.

Instructions: Set to Enable or Disable. We recommend that you enable BofL.

MIB Object ID: 1.3.6.1.4.1.18.3.4.1.1.7

Parameter: BofL Timeout

Path: Configuration Manager > **XCVR** Connector > **Edit Line** > Edit CSMA/CD Parameters

Default: 5 seconds

Range: 1 to 60 seconds

Function: Specifies the time between transmissions of Breath of Life messages from this Ethernet interface. Timeout will occur if five periods elapse without a successful BofL message transmission. When timeout occurs, the router disables and reenables the Ethernet interface.

This parameter is valid only if you set BofL Enable to Enable.

Instructions: Accept the default BofL timeout of 5 seconds, or specify a new value up to 60 seconds.

MIB Object ID: 1.3.6.1.4.1.18.3.4.1.1.8

Parameter: **Hardware Filter**

Path: Configuration Manager > **XCVR** Connector (10Base-T only) > **Edit Line** > Edit CSMA/CD Parameters

Default: Disable (the default changes to Enable when, while adding the circuit , you reply OK to the prompt
`Do you want to enable Hardware Filters on this circuit?`)

Range: Enable | Disable

Function: Enables filtering hardware in the link or net module to drop local frames at the interface instead of copying them into system memory. Enabling hardware filters improves bridging software performance because router resources are not used to receive and reject local frames.

Instructions: Set to Enable only if you enabled the bridge software and the link or net module has hardware filters.

MIB Object ID: 1.3.6.1.4.1.18.3.4.1.1.29

Parameter: **BofL Retries**

Path: Configuration Manager > **XCVR** Connector > **Edit Line** > Edit CSMA/CD Parameters

Default: 5 retries; 4 when the interface is configured for router redundancy

Range: 1 to 60 retries

Function: Specifies the number of BofL messages this interface retransmits before the router declares the circuit down.

Instructions: Either accept the default of 5 BofL retries, or specify a value from 1 to 60 retries. Use this parameter in conjunction with BofL Timeout Divisor and BofL Timeout to decrease or increase the time it takes the router to declare an interface down.

MIB Object ID: 1.3.6.1.4.1.18.3.4.1.1.59

Parameter: **BofL Timeout Divisor**

Path: Configuration Manager > **XCVR** Connector > **Edit Line** > Edit CSMA/CD Parameters

Default: 1; 10 when the interface is configured for router redundancy

Range: An integer from 1 to 59, less than or equal to the value of the BofL Timeout parameter

Function: The BofL Timeout parameter specifies a time period between transmissions of BofL messages from this Ethernet interface. Beginning with Router Software Version 11.01, the actual time between BofL transmissions is the value of the BofL Timeout parameter divided by the value of the BofL Timeout Divisor parameter. When set to a value greater than 1, this parameter reduces the value of BofL Timeout.

When you configure router redundancy on an interface, Site Manager automatically sets this parameter to reduce the time between BofL transmissions. If the circuit goes down, the interface reaches the BofL Retries value sooner, thus reducing the time it takes the router to declare a circuit down.

Instructions: Increase the value of this parameter if you want line status be detected in less than 1-second intervals. Leave this parameter set to 1 and use the BofL Timeout parameter for 1- to 5-second timeout values.

For example, with the BofL Timeout parameter set to 5 seconds and the BofL Timeout Divisor set to 10, the router sends a BofL message every 0.5 second (5 divided by 10). With BofL Timeout set to 5 seconds and BofL Timeout Divisor set to 1, transmissions are every 5 seconds.

MIB Object ID: 1.3.6.1.4.1.18.3.4.1.1.60

Parameter: **Interface Line Speed**

Path: Configuration Manager > **XCVR** Connector (100Base-T only) > **Edit Line** > Edit CSMA/CD Parameters

Default: 100Base-TX / 100Base-FX

Range: Auto Negotiation │ 100Base-TX / 100Base-FX │ 100Base-FD (Full Duplex) │ 100Base-FD w/ Cong Control

Function: Specifies the configured line speed and duplex setting for the selected interface, or enables automatic line negotiation.

Instructions: To enable automatic line negotiation, select Auto Negotiation. Note that full-duplex support negotiated automatically is without congestion control.

To configure a specific line speed, select one of the following:

- 100BaseE-TX / 100Base-FX (half-duplex over either twisted-pair or fiber cabling)
- 100Base-FD (full-duplex without congestion control)
- 100Base-FD w/ Cong Control (full-duplex with congestion control)

Selecting a specific line-speed configuration disables Auto Negotiation.

MIB Object ID: 1.3.6.1.4.1.18.3.4.16.1.1.4

Parameter: **Line Advertising Capabilities**

Path: Configuration Manager > **XCVR** Connector (100Base-T only) > **Edit Line** > Edit CSMA/CD Parameters > Interface Line Speed parameter = Auto Negotiation > **OK** > **Configure Line Capabilities** > Line Advertising Capabilities

Default: 11

Range: 00 │ 01 │ 10 │ 11

Function: Specifies the line configurations available to remote nodes that have automatic line negotiation capability.

Instructions: Select the code for the desired line advertising:

- 100Base-TX, half-duplex only = 10
- 100Base-TX, full-duplex only = 01
- 100Base-TX, both half- and full-duplex = 11
- No advertising = 00

MIB Object ID: 1.3.6.1.4.1.18.3.4.16.1.1.9

FDDI Line Parameters

Parameter: Enable

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters

Default: Enable

Options: Enable | Disable

Function: Enables or disables the FDDI circuit for the selected connector.

Instructions: Set to Enable or Disable.

MIB Object ID: 1.3.6.1.4.1.18.3.4.4.1.2

Parameter: BofL Enable

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters

Default: Enable

Range: Enable | Disable

Function: Enables or disables BofL polling.

When you set both this parameter and the LLC Data Enable parameter to Enable, the router disables the LLC interface after the time you specify using the BofL Timeout parameter if the link becomes unavailable.

When you set this parameter to Disable, the router disables the LLC interface immediately after the link becomes unavailable.

Instructions: Set to Enable or Disable.

MIB Object ID: 1.3.6.1.4.1.18.3.4.4.1.7

Parameter: **BofL Timeout**

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters

Default: 3 seconds

Options: 0 to 3600 seconds

Function: When BofL is enabled and the link becomes unavailable, this parameter specifies the time Site Manager waits before disabling the LLC interface.

Instructions: Accept the default value, 3 seconds, or specify a new value. Be sure to set the BofL Enable parameter to Enable.

MIB Object ID: 1.3.6.1.4.1.18.3.4.4.1.8

Parameter: **Hardware Filter**

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters

Default: Disable (the default changes to Enable when, while adding the circuit , you reply OK to the prompt `Do you want to enable Hardware Filters on this circuit?`)

Options: Enable | Disable

Function: When you set this parameter to Enable, the link module filtering hardware, if present, does not allow the router to copy local frames into memory. In essence, the filtering hardware drops local frames at the interface. Hardware filtering improves performance because the bridging software no longer uses resources to receive and reject those frames.

Instructions: Set to Enable only if the link module has hardware filters and you enabled bridge software.

MIB Object ID: 1.3.6.1.4.1.18.3.4.4.1.37

Parameter: **Connection Policy**

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **SMT Attributes** > FDDI SMT Attributes

Default: 0xff65

Options: 0x0 to 0xffff

Function: Specifies the connection policies this line requests at the FDDI station.

The policy descriptor takes the form “rejectX-Y” where X denotes the physical connection (PC) type of the local port, and Y denotes the PC type of the neighbor port. X and Y can have the following values:

- A -- Indicates that the port is a dual-attachment station or concentrator that attaches to the primary IN and the secondary OUT when attaching to the dual FDDI ring
- B -- Indicates that the port is a dual-attachment station or concentrator that attaches to the secondary IN and the primary OUT when attaching to the dual FDDI ring
- S -- Indicates a port in a single-attachment station or concentrator
- M -- Indicates a port in a concentrator that serves as a master to a connected station or concentrator

Instructions: Specify the status word value that represents the connection policies you want this line to reject. Start with a value of zero for the status word (all bits set to 0). For each connection policy you want the node to reject, add to the status word value the number 2 raised to a power specified in Table 3-1 (Chapter 3). This is equivalent to setting a bit to 1 for each policy that you want the node to reject.

MIB Object ID: 1.3.6.1.4.1.18.3.4.4.1.30

Parameter: **T_Notify Timeout**

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **SMT Attributes** > FDDI SMT Attributes

Default: 22 seconds

Options: 2 to 30 seconds

Function: Specifies the interval between successful iterations of the Neighbor Notification Protocol.

Instructions: Accept the default value of 22 seconds or specify a new value from 2 to 30 seconds.

MIB Object ID: 1.3.6.1.4.1.18.3.4.4.1.31

Parameter: User Data

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **SMT Attributes** > FDDI SMT Attributes

Default: None

Options: Any string up to 32 alphanumeric characters

Function: Allows you to enter additional information about the router. This information is attached to the status information frames (SIFs).

Instructions: Enter up to 32 alphanumeric characters.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.1.3.1.8

Parameter: Status Report Protocol

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **SMT Attributes** > FDDI SMT Attributes

Default: Enable

Options: Enable | Disable

Function: Specifies whether the node will generate Status Report Frames (SRFs) for its implemented events (for example, high bit errors, topology changes, trace status events, MAC frame error condition, port LER condition, and MAC duplicate address condition).

Instructions: Accept the default, Enable, if you want the node to generate SRFs; specify Disable if you do not want the node to generate SRFs. We recommend using Enable to ensure that your FDDI network is ANSI-compliant.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.1.3.1.14

Parameter: Trace Max Expiration (ms)

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **SMT Attributes** > FDDI SMT Attributes

Default: 7000 milliseconds (7 seconds)

Options: 6001 to 256000 milliseconds

Function: Specifies the maximum propagation time for a trace on an FDDI topology.

Instructions: Enter a value from 6001 to 256000. We recommend accepting the default value of 7000 milliseconds.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.1.3.1.15

Parameter: Duplicate Address Protocol

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **SMT Attributes** > FDDI SMT Attributes

Default: Enable

Options: Enable | Disable

Function: Implements an optional ANSI duplicate address test involving periodic transmission of Network Service Address Network Interface Function (NSA NIF) frames to the source.

Instructions: Accept the default, Enable, if you want to test for duplicate addresses. Specify Disable if you do not want to test for duplicate addresses.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.1.3.1.18

Parameter: LLC Data Enable

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **MAC Attributes** > FDDI MAC Attributes

Default: Enable

Options: Enable | Disable

Function: Specifies whether the MAC is available to transmit and receive Logical Link Control (LLC) Protocol Data Units (PDUs). If you accept Enable, the interface to the MAC entity is available to exchange PDUs between the MAC and the local LLC entity when the ring becomes operational. Setting this attribute does not affect transferring and receiving MAC or SMT frame types.

Instructions: Accept the default, Enable, if you want the MAC available for transmitting and receiving LLC PDUs; specify Disable if you do not want the MAC available for transmitting and receiving LLC PDUs.

MIB Object ID: 13.6.1.4.1.18.3.4.15.2.3.1.17

Parameter: Tvx Lower Bound (ms)

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **Path Attributes** > FDDI Path Attributes

Default: 2.5 milliseconds (ms)

Options: The value must be greater than zero and less than the value of Requested TTRT. If the value of Requested TTRT is greater than 5.2 ms, set this parameter to a value less than or equal to 5.2 ms. For example, if the value of Requested TTRT is 165 ms, the value for Tvx Lower Bound must be less than or equal to 5.2 ms.

Function: Specifies the minimum time value of the Valid Transmission Timer (TVX).

Instructions: Accept the default value of 2.5 milliseconds or specify a new value less than or equal to 5.2 milliseconds and less than the value of Requested TTRT.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.3.3.1.5

Parameter: T_Max Lower Bound (ms)

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **Path Attributes** > FDDI Path Attributes

Default: 165 milliseconds (ms)

Options: 10 to 1336.9344 ms

Function: Allows you to specify the maximum time value of TTRT. The value must be greater than or equal to 10 ms, greater than or equal to the value of the Requested TTRT (ms) parameter, and less than or equal to 1336.9344 ms.

Instructions: Accept the default value of 165 ms, or specify a new value less than or equal to 1336.9344 ms and greater than or equal to the value of the Requested TTRT (ms) parameter.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.3.3.1.6

Parameter: Requested TTRT (ms)

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **Path Attributes** > FDDI Path Attributes

Default: 165 milliseconds (ms)

Options: Variable. This value must be greater than the value specified for the TVX Lower Bound (ms) parameter and less than or equal to the value specified for the T_Max Lower Bound (ms) parameter.

Function: Specifies the target token rotation time carried in claim frames issued by the FDDI station.

Instructions: Accept the default of 165 ms or enter a new value in milliseconds.

MIB Object ID: 1.3.6.1.4.1.18.3.4.4.1.32

Parameter: LER Cutoff

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **Port Attributes** > FDDI Port Attributes

Default: 7

Options: 4 to 15

Function: Specifies the link error rate estimate at which a link connection is broken. It ranges from 10^{-4} to 10^{-15} and is reported as the absolute value of the base 10 logarithm.

Instructions: Accept the default value of 7 or specify a new value.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.4.3.1.17

Parameter: LER Alarm

Path: Configuration Manager > **FDDI** Connector > **Edit Line** > Edit FDDI Parameters > **Expert** > **Port Attributes** > FDDI Port Attributes

Default: 8

Options: 4 to 15

Function: Specifies the link error rate estimate at which a link connection generates an alarm. It ranges from 10^{-4} to 10^{-15} and is reported as the absolute value of the base 10 logarithm of the estimate.

Instructions: Accept the default value of 8 or specify a new value.

MIB Object ID: 1.3.6.1.4.1.18.3.4.15.4.3.1.18

Token Ring Line Parameters

Parameter: Enable

Path: Configuration Manager > **TOKEN** Connector > **Edit Line** > Edit Token Ring Parameters

Default: Enable

Options: Enable | Disable

Function: Enables or disables the token ring circuit.

Instructions: Set to Disable if you want to disable the token ring circuit.

MIB Object ID: 1.3.6.1.4.1.18.3.4.2.1.2

Parameter: MAC Address Override

Path: Configuration Manager > **TOKEN** Connector > **Edit Line** > Edit Token Ring Parameters

Default: None

Options: Any valid, 48-bit MAC-level address

Function: Assigns a user-specified MAC address.

Instructions: If you want the router to generate the MAC address for this token ring interface, ignore this parameter.

If you want to specify a MAC address (for example, to avoid host number conflicts on a directly connected IPX or XNS network), enter the 48-bit MAC address in MSB format; that is, enter 0x followed by 12 hexadecimal digits.

If you enter a MAC address with this parameter, you must set the MAC Address Select parameter to CNFG.

MIB Object ID: 1.3.6.1.4.1.18.3.4.2.1.9

Parameter: **MAC Address Select**

Path: Configuration Manager > **TOKEN** Connector > **Edit Line** > Edit Token Ring Parameters

Default: PROM

Options: BOXWIDE | PROM | CNFG

Function: Determines the source of the MAC address.

Instructions: Enter BOXWIDE if you want the token ring interface to use a MAC address that the software generates from the router's serial number.

Enter PROM if you want the token ring interface to use a MAC address from programmable read-only memory on the Token Ring link module.

Enter CNFG if you explicitly assigned a MAC address with the MAC Address Override parameter.

MIB Object ID: 1.3.6.1.4.1.18.3.4.2.1.10

Parameter: **Speed**

Path: Configuration Manager > **TOKEN** Connector > **Edit Line** > Edit Token Ring Parameters

Default: 16 Mb/s

Options: 16 Mb/s | 4 Mb/s

Function: Specifies the speed of the token ring media. If you select 16 Mb/s, the router enables the Early Token Release protocol, which is used extensively on 16-Mb/s media. In the unlikely event that you want to disable Early Token Release over 16-Mb/s token ring media, you can do so with the Early Token Release parameter.

Instructions: Enter the ring speed.

MIB Object ID: 1.3.6.1.4.1.18.3.4.2.1.11

Parameter: Early Token Release

Path: Configuration Manager > **TOKEN** Connector > **Edit Line** > Edit Token Ring Parameters

Default: Enable

Options: Enable | Disable

Function: Indicates whether the token can return to the ring before the recipient copies all data. This parameter is valid only when you set the Speed parameter to 16 Mb/s.

Instructions: Accept the current value.

MIB Object ID: 1.3.6.1.4.1.18.3.4.2.1.12

Appendix B
Default Line Parameter Settings

Tables B-1 through B-7 list the default settings for LAN line attribute parameters, in the following sections:

- Ethernet (CSMA/CD) Line Parameters
- FDDI Line Parameters
- Token Ring Line Parameters

You can use the Configuration Manager to edit any of the default settings.

Ethernet (CSMA/CD) Line Parameters

Table B-1. Ethernet Line Parameters

Parameter	Default
Enable	Enable
BOFL Enable	Enable
BOFL Timeout	5 (4 with router redundancy enabled)
BOFL Retries	5
BOFL Timeout Divisor	1 (10 with router redundancy enabled)
Hardware Filter (10-Mb/s Ethernet only)	Disable
Interface Line Speed (100-Mb/s Ethernet only)	100BASE-TX/100BASE-FX
Line Advertising Capabilities (100-Mb/s Ethernet only)	11

FDDI Line Parameters

Table B-2. FDDI Line Parameters

Parameter	Default
Enable	Enable
BOFL Enable	Enable
BOFL Timeout	3 s
Hardware Filter	Disable (this default is changed to Enable if you add a circuit and reply OK to the prompt `Do you want to enable Hardware Filters on this circuit?`)

Table B-3. FDDI SMT Attribute Parameters

Parameter	Default
Connection Policy	0xff65
T_Notify Timeout (s)	22 s
Trace Max Expiration (ms)	7000 ms (7 s)
Status Report Protocol	Enable
Duplicate Address Protocol	Enable
User Data	None

Table B-4. FDDI MAC Attribute Parameters

Parameter	Default
LLC Data Enable	Enable

Table B-5. FDDI Path Attribute Parameters

Parameter	Default
Tvx Lower Bound (ms)	2.5 ms
T_Max Lower Bound (ms)	165 ms
Requested TTRT (ms)	165 ms

Table B-6. FDDI Port Attribute Parameters

Parameter	Default
LER Cutoff	7
LER Alarm	8

Token Ring Line Parameters

Table B-7. Token Ring Line Parameters

Parameter	Default
Enable	Enable
MAC Address Override	None
MAC Address Select	PROM
Speed	16 MB/s
Early Token Release	Enable

Glossary

Attribute See *parameter*. Properties or functional aspects of a configurable MIB object.

Channel The multiplexed signal for one voice or data conversation, running simultaneously with other channels over a single logical or physical line.

Circuit A data communication path established between two network hosts; for example, a permanent or switched virtual circuit (PVC or SVC) over a packet- or cell-switched network, or over a dial or leased-line connection.

Connector The physical and electrical means to interconnect an interface module in a network device directly or indirectly to a physical network medium.

Interface A data link/physical layer connection to a physical network transmission medium. An interface includes media-specific driver software.

Line The physical medium that completes a circuit path, identified typically by connector, slot, and media type. In a *multiline* circuit, one circuit uses multiple lines for added bandwidth.

Logical Line See *line*. A logical path on a physical circuit.

Parameter See *attribute*. A Site Manager variable that defines a specific MIB attribute or set of MIB attributes.

Port See *connector*. On a network device or a user endstation, a logical point of termination for data sent or received by a specific protocol or application.

Slot The physical and electrical means to interconnect an interface module in a network device directly or indirectly to a physical network medium.

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